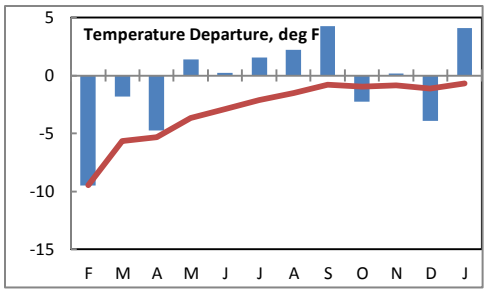
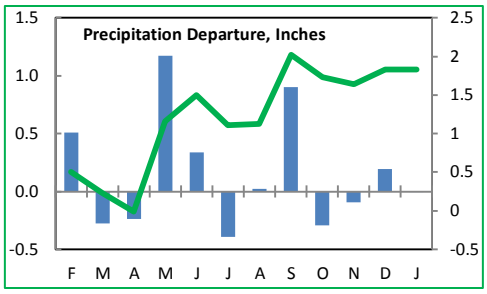
Montana Weather/Precipitation Summary

February 2014 by NOAA's National Weather Service Great Falls Montana

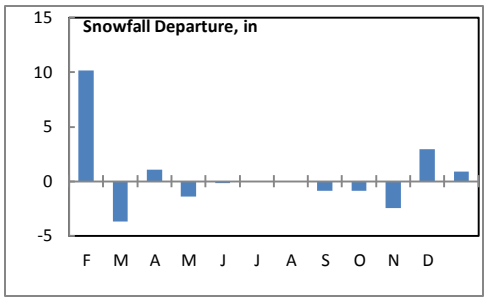
Temperatures averaged below normal across the state in February. A ridge of high pressure just off the west coast of North America brought sustained northwest flow to Montana, while a trough of low pressure over central North America was stronger than normal (Figure 1). This trough brought cold air to the state for most of the month.

Statewide composite temperatures averaged 9.5°F below normal for the month. This was the largest monthly temperature anomaly since January 2006, when temperatures averaged 11.1°F above normal. Figure 2 shows the areas of temperature anomalies. The greatest negative anomaly was around Shelby, where temperatures were more than 14.5°F below normal. The smallest departure was in the West Yellowstone area. The warmest average February temperature was 26.1°F at Norris Madison (Madison County), and the coolest was 7.8°F at Plentywood. For the past 12-months, the statewide composite average temperature is 0.7°F below normal. This was the coolest February since 1989.

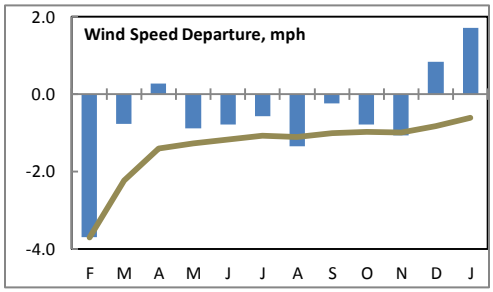




The monthly departure from normal for precipitation across Montana is shown in Figure 3. This figure shows that above normal precipitation was common across the southwest portion of the stat, with generally below normal values over the northern tier and portions of the east. The heaviest precipitation fell along the western border. Values of nine to over 15 inches were reported over higher elevations in the west. The precipitation figure to the right shows that this month had a 0.51-inch positive departure. The statewide composite precipitation for the past 12 months is over 1.8-inches above normal. This was the wettest February since 1986. Billings had their wettest February of record, as did Helena. Dillon is in the midst of their driest water year of record. This is the driest year to date since 1990.



Although the northern tier east of the continental divide and the eastern third of the state recorded little snowfall, the statewide composite was much above the long-term normal. This month ranked as the second snowiest February of record. Only February 1936 had a higher state average snowfall.



On a statewide average, winds were below normal this month. The western one-half of the state generally had above normal speeds, with below normal values in the east, resulting in a composite average of 9.8 mph, or 3.2 mph below normal. This month had the greatest monthly departure since February 2012, when wind speeds averaged 5.5 mph below normal. Only three of the past 12-months have had wind speeds averaging above normal. The fastest measured gust of the month, 118 mph, occurred at Logan Pass. For the past 12-months, winds are running 0.6-mph below average.

Refer to NCDC's State of the Climate report for the latest monthly discussion: http://www.ncdc.noaa.gov/sotc/.

February 1-10
The first ten days of February were on the cold side. Temperatures averaged as much as 45 degrees below normal. A period of snow on the third brought a new daily record amount to Great Falls (3.3-inches), and ten inches to West Yellowstone. Very cold air pushed into the state by the fifth, with record lows across many parts of the state on the fifth and sixth. Elk Park dropped to -50F on the sixth, which was the first -50 reading in the state since January 2007. Wisdom fell to -48°F. Great Falls, dropping to -34°F, had their coldest February temperature since 1996. Sea level pressure reached 1050.2 millibars (mb) at Havre. This was the third time this winter with values over 1050 mb in Montana. Even though reaching 1050 mb is uncommon, it is very rare to have three such visits to Montana during a winter. Once temperatures began to slightly moderate with the next weather maker pushing into Montana, heavy snow fell across portions of the southern portions of the state from the eighth through tenth. Billings and Joliet picked up 10 inches of snow, while Sula measured 13 inches. The warmer air brought winds.

February 11-20
Warmer and windy conditions prevailed for this 10 day period. While warm and windy conditions spread across the state, some freezing rain fell in the Missoula area on the 11th. Winds gusted to 78 mph in the Sweet Grass Hills. Strong winds continued on the 12th and 13th. Gusts reached 118 mph at Logan Pass, 90 mph at Cascade, and 75 mph at Livingston and Malta. These were the strongest February winds in Montana since 2007. Gusty winds returned on the 16th and 17th. Gusts reached 107 mph at Logan Pass, 75 mph at Nye and 68 mph in the Sweet Grass Hills. Strong westerly flow brought moisture for 12-14 inches of snow over the western mountains and even Teton Pass. Blizzard conditions were seen over Marias Pass on the 17th. Strong winds on the 18th and 19th produced gusts to 96 mph at Logan Pass, 80 mph in the Sweet Grass Hills, and 73 mph in Fergus County.

February 21-28
Cold and snow returned for the last part of the month. Six to ten inches of snow fell over the western valleys on the 21st, with up to a foot of snow at Teton Pass. On the 23rd and 24th, bands of snow set up from Missoula through Billings. A foot or more of snow fell over Livingston, Roundup, Jefferson City, Winston and Billings. Twenty-two inches fell at Seeley Lake. Snow returned on the 27th and 28th. Billings picked up another 8.6 inches, Missoula 9.1 inches. Heavier amounts fell over the higher elevations. Local blizzard conditions occurred on the 28th over western Montana, and portions of the southwest.

Precipitation/convection

Severe convective weather occurred on no days in February. This is normal for the month.

December through February
For the winter season, temperatures averaged below normal. While January was above normal, temperatures December and February were much below normal. For the season, statewide temperatures averaged 18.6°F, 3.1°F below normal. This was the coldest winter season since 2010-11, and the 44th coldest of record.

Precipitation averaged above normal. January was right at normal, with December and February above normal. With a composite average of 2.91 inches, this is the 25th wettest winter season of record, and the wettest since 2010-11.

Winds averaged just slightly below normal. While December and January had higher than normal wind speeds, February was much below normal. Wind speed averages were 10.2 mph, or 0.2 mph below normal. This was the 29th calmest winter season of record.

Snowfall was above normal. February had much above normal snowfall, while December and January were slightly above normal. With an average of 43.7 inches for this period, this was the 8th snowiest winter of record, and the snowiest since 2010-11.

February summary information:

High Temperature	58°F at Yellowtail Dam (16th)	**Greatest Precip**	8.25" at Mullan Pass
Low Temperature	-50°F at Elk Park (6th)		15.10" at Twin Lakes SNOTEL
Warmest Ave Temp	26.1° at Norris Madison	**Peak Wind Gust**	118 mph at Logan Pass (Glacier) (13th)
Coolest Ave Temp	7.8°F at Plentywood		90 mph at Cascade (12th)
Range of Temp departures	-14.6°F at Shelby to -3.3°F at West Yellowstone	**Highest Ave Wind**	24.9 mph at Logan Pass 17.5 mph at Livingston
21 city mean monthly Temperature/Normal	14.7/24.2F 9.5F below normal. 19th coldest of record (since 1880). 14th percentile. Oct-Feb 25.6/27.9 2.3F below normal. 35th coolest of record.	**20 city mean monthly wind speed/Normal**	9.8 mph/13.0 mph; 44th calmest of record (since 1936). 56th percentile. Oct-Feb 9.3mph/9.8 0.5-mph below normal. 35th calmest of record.
22 city mean monthly precipitation/Normal	1.13/0.51" – 221% of normal. 5th wettest of record (since 1880). 94th percentile Oct-Feb 4.44"/4.12" 0.32" above normal. 57th wettest of record.	**20 city mean monthly snowfall and normal**	18.2/8.1" – 10.1" above normal. 2nd highest. 98th percentile. Oct-Feb 52.1"/41.5" 10.6" above normal. 17th highest.

Historical Rank of Precipitation (inches)
for the Current Month and Water Year to Date

Location	Feb	% of Norm	Rank	Pcntl	Oct 1 – Feb 28	% of norm	Rank	Pcntl	Years
Baker	0.20	62%			2.92	118%			16
Billings	2.06	355%	116	100	7.97	196%	111	98	113
Belgrade	0.66	147%	64	82	2.00	60%	7	8	77
Butte	0.63	147%	83	69	1.90	68%	22	18	120
Cut Bank	0.15	71%	32	29	2.09	148%	73	68	107
Dillon	0.21	88%	44	58	0.72	39%	2	1	74
Glasgow	0.22	85%	45	38	1.80	83%	31	26	115
Great Falls	1.12	238%	108	88	4.47	150%	102	83	122
Havre	0.24	86%	45	33	2.67	132%	73	54	134
Helena	1.98	660%	137	100	3.53	158%	96	70	136
Jordan	0.39	156%			3.02	147%			16
Kalispell	1.09	112%	75	62	6.89	109%	75	62	120
Lewistown	0.29	66%	25	20	3.36	96%	40	33	118
Livingston	0.69	138%	91	79	3.39	101%	56	50	111
Miles City	0.11	48%	21	15	1.93	90%	42	30	137
Missoula	2.47	353%	137	99	5.05	111%	71	53	134
Mullan Pass	8.25	263%	70	97	23.57	111%	39	53	73
Wolf Point	0.08	38%			0.70	35%			16
Glendive	0.32	100%	65	54	2.85	111%	76	66	115
Sidney	0.08	24%	8	9	2.50	86%	41	56	73
BZN-MSU	1.39	178%	125	92	5.26	97%	82	60	135

Rankings and Percentiles are 1=driest, higher numbers=wetter.
For an automated version of this chart, updated daily, go to
http://www.wrh.noaa.gov/tfx/dx.php?wfo=tfx&type=&loc=products&fx=PCPNTOTALS

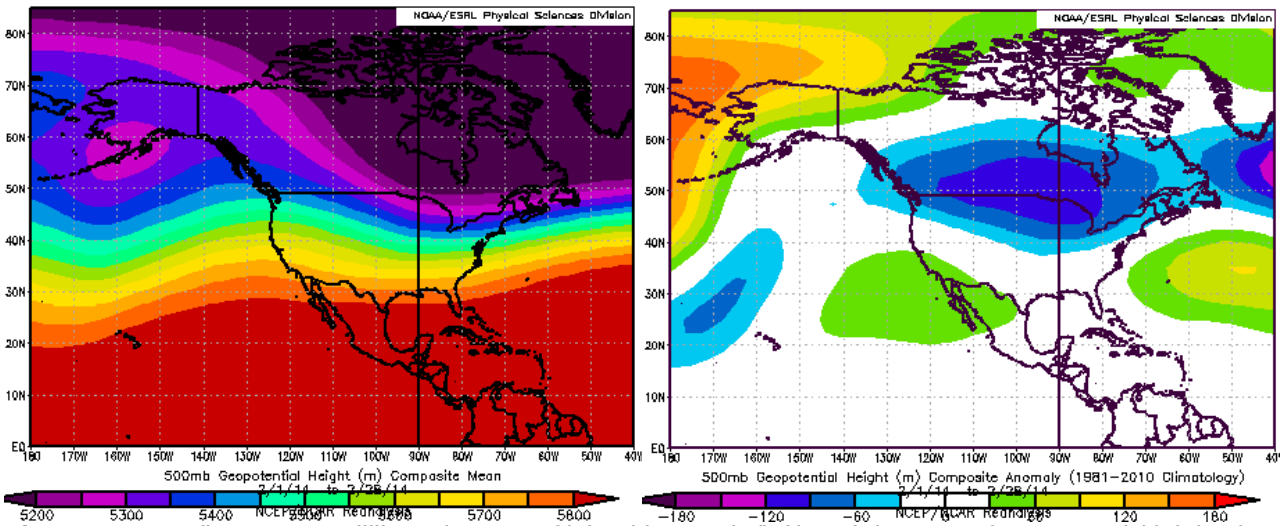


Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (left) and departure from normal (right). The trough over North America was stronger than normal.

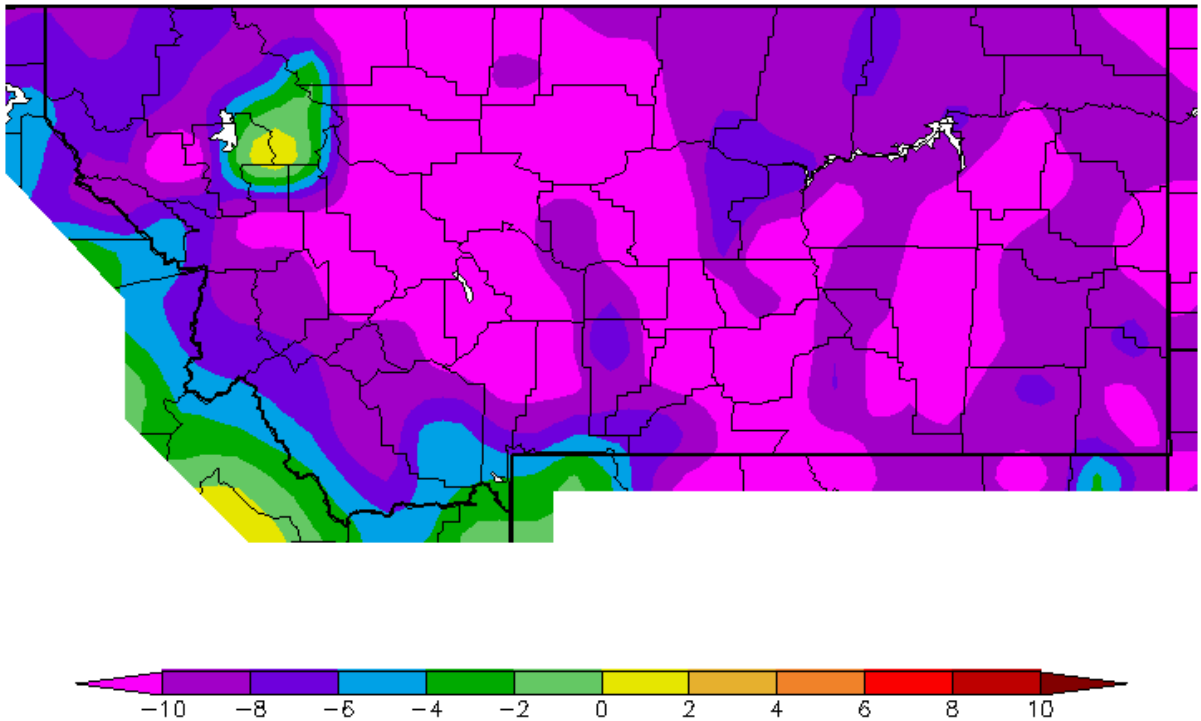


Figure 2. February2014 temperature departures from normal (°F) (Western Region Climate Center).

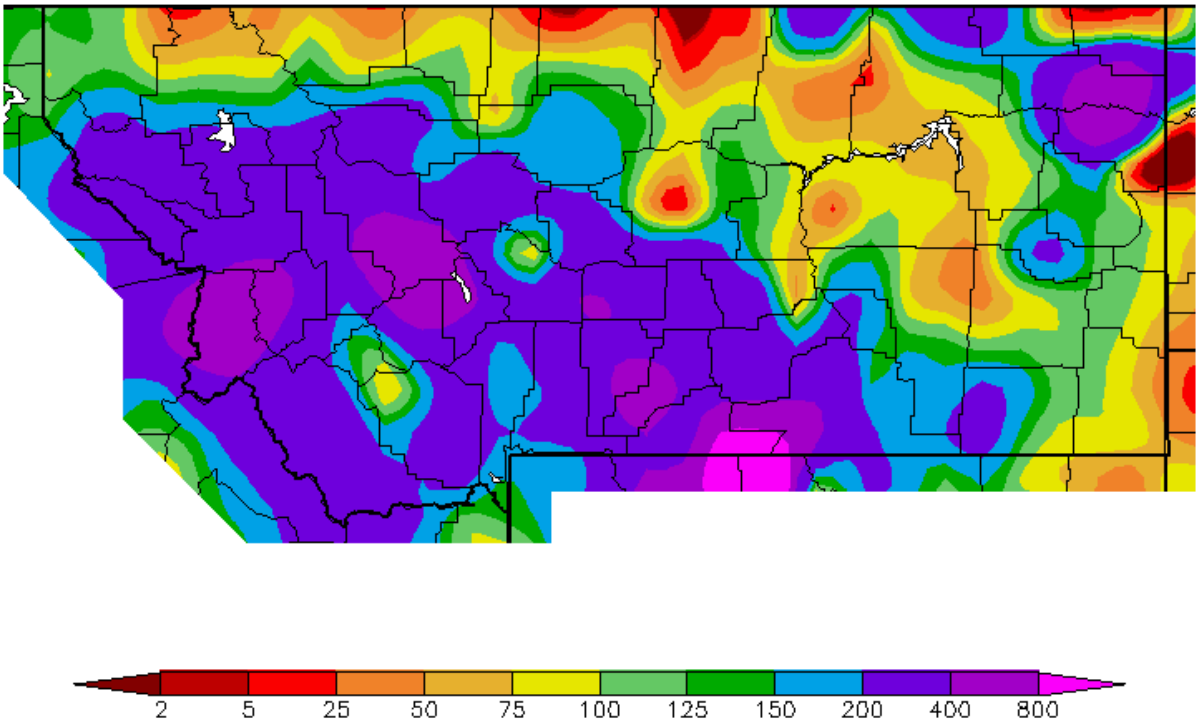


Figure 3. February 2014 precipitation departures from normal (percent) (Western Region Climate Center).

For a state map of % of normal water year precipitation (updated around the 7th of each month), go to: http://www.wrh.noaa.gov/tfx/image.php?wfo=tfx&type=data&loc=hydro&fx=watyr_pcntnorm.png

For the latest information on mountain snow pack from the NRCS, go to: http://www.mt.nrcs.usda.gov/snow/index.html

For the latest U.S. Drought Monitor, issued weekly by the Climate Prediction Center (CPC), go to: http://www.drought.unl.edu/dm/monitor.html

These data are preliminary and have not undergone final QC by NCDC. Therefore, these data are subject to revision. Final and certified climate data can be access at the National Climatic Data Center (NCDC) http://www.ncdc.noaa.gov. Many more links are on the Drought Information Page of the NWS Great Falls web site at http://www.wrh.noaa.gov/tfx/main/drought.php?wfo=tfx. The climatological record for normals is 1981-2010. The ranking period for temperature, precipitation and snowfall is since 1880. The ranking period for wind speeds is since 1936. The ranking period for soil moisture is since 1995.